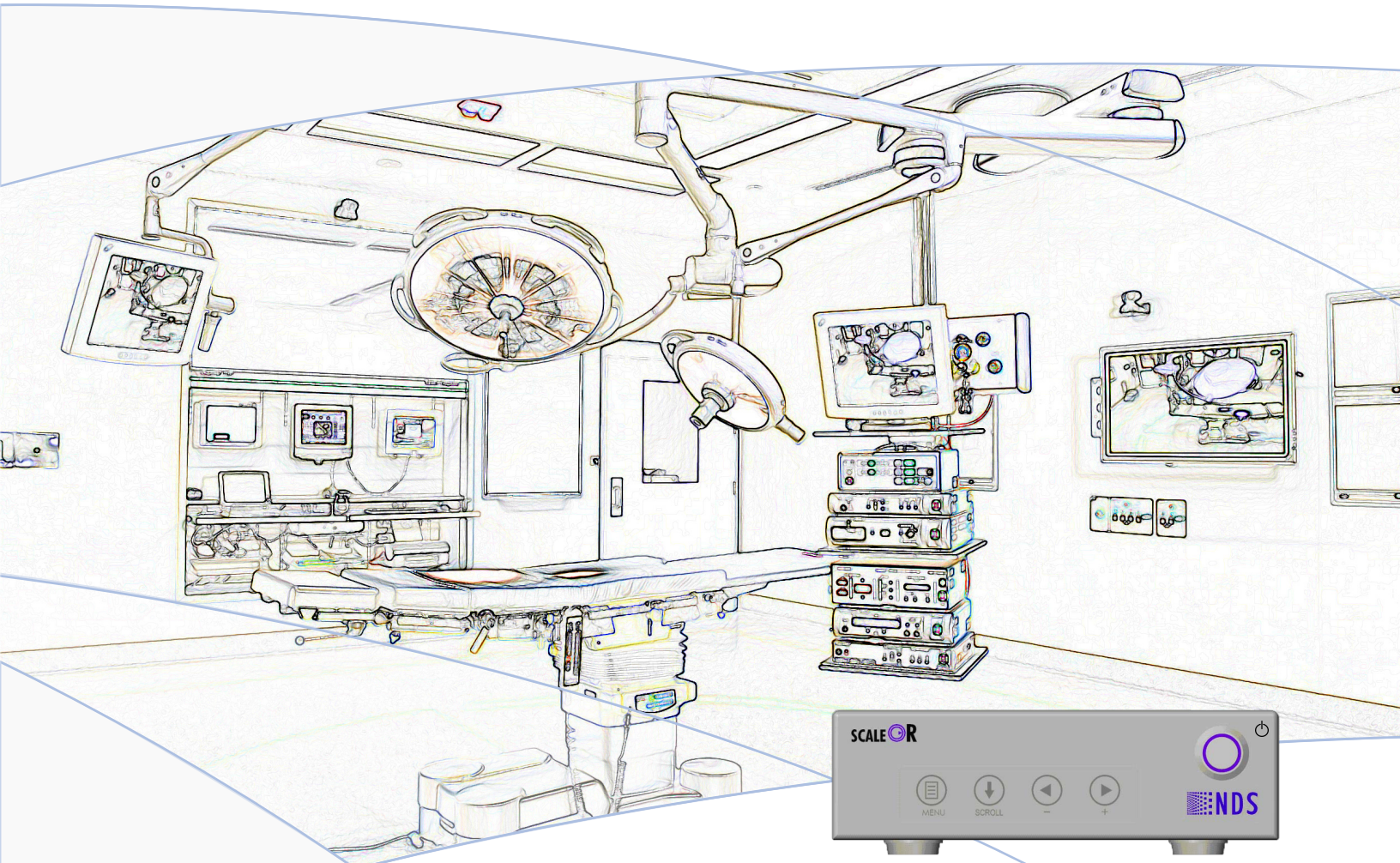
NDS
SURGICAL · IMAGING



VIDEO SCALING SYSTEM

Informatics

SCALE OR™

USER MANUAL

[ENGLISH]

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1 Warnings and Cautions

This symbol alerts the user that important information regarding the installation and / or operation of this equipment follows. Information preceded by this symbol should be read carefully in order to avoid damaging the equipment.

This symbol warns user that un-insulated voltage within the unit may have sufficient magnitude to cause electrical shock. Therefore, it is dangerous to make contact with any part inside the unit. To reduce the risk of electric shock, **DO NOT** remove cover (or back). There are no user serviceable parts inside. Refer servicing to qualified service personnel.

This symbol cautions the user that important information regarding the operation and / or maintenance of this equipment has been included. Information preceded by this symbol should be read carefully to avoid damage to the equipment.

This symbol denotes the manufacturer.

This symbol denotes the manufacturer's European Community representative.

To prevent fire or shock hazards, do not expose this unit to rain or moisture. Also, do not use this unit's polarized plug with an extension cord receptacle or other outlets unless the prongs can be fully inserted. The product is designed to meet the medical safety requirements for a patient vicinity device.
This equipment/system is intended for use by healthcare professionals only.

Safety Compliance:
This product is T.U.V. approved WITH RESPECT TO ELECTRIC SHOCK, FIRE AND MECHANICAL HAZARDS ONLY IN ACCORDANCE WITH UL 60601-1/CAN/CSA C22.2 NO. 60601-1 and ANSI/AAMI ES60601-1.

Safety Compliance:
This product meets the requirements of EN-60601-1 so as to conform to the Medical Device Directive 93/42/EEC and 2007/47/EC (general safety information).

WARNING:
CLASS I LASER PRODUCT. DO NOT STARE INTO LASER BEAM

This product complies to the above standards **only** when used with the supplied medical grade power supply.
Power supply: Ault and SL Power Electronic Corp Model: MENB1030A1200C02 12VDC

Disconnect the power supply from the AC mains. The power supply is the only recognized disconnect device.
The MEDICAL EQUIPMENT should be positioned so that its disconnect device is readily accessible.

The product should be powered from a center tapped circuit when used in the US at voltages over 120 volts. Monitor is intended for continuous operation.

This product is energized from an external electrical power source for class 1 equipment. It is the responsibility of the installer to test the product's earth ground to verify that it complies with the hospital, local and national impedance requirements.

Recycling:

Follow local governing ordinances and recycling plans regarding the recycling or disposal of this equipment .

Declarations of Conformity

FCC and Council Directives of European Standards:

This device complies with Part 15 of FCC rules and 93/42/EEC of the Council Directives of European Standards Directive as amended by 2007/47/EC. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesirable results.

1. Use the specified cables with this device so as not to interfere with radio and television reception. Use of other cables and / or adapters may cause interference with other electronic equipment.
2. This equipment has been tested and found to comply with the limits pursuant to FCC part 15 and CISPR 11. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

IEC:

This equipment has been tested and found to comply with the limits for medical devices to the IEC 60601-1-2. These limits are designed to provide reasonable protection against harmful interference in a typical medical installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to other devices in the vicinity.

FCC, Council Directives of European Standards and IEC:

There is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult your dealer or an experienced radio/TV technician for help.

Accessory equipment connected to this product must be certified according to the respective IEC Standards (i.e., IEC 60950-1) for data processing equipment and IEC 60601-1 for medical equipment). Furthermore, all configurations shall comply with the system standard, IEC 60601-1-1. Anyone who connects additional equipment to the signal input part or signal output part configures a medical system, and is therefore responsible that the system complies with the requirements of system standard IEC 60601-1-1. Whoever is responsible for securing the unit to a system needs to insure that the mounting equipment used with this product complies to IEC standard 60601-1. If in doubt, consult the technical services department or your local representative.

Legal Statement

NDS sells its products through other medical device manufacturers, distributors and resellers and therefore, purchasers of this NDS product should consult with the entity through which this product was originally purchased regarding the terms of any applicable product warranties provided by such entity, if any.

NDS neither assumes nor authorizes any person to assume for it any other liabilities in conjunction with and/or related to the sale and/or use of its products. To ensure proper use, handling and care of NDS products, customers should consult the product specific literature, instruction manual, and/or labeling included with the product or otherwise available.

Customers are cautioned that system configuration, software, the application, customer data and operator control of the system, among other factors, affect the product's performance. While NDS products are considered to be compatible with many systems, specific functional implementation by customers may vary. Therefore, suitability of a product for a specific purpose or application must be determined by the consumer and is not warranted by NDS.

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About This Manual

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This manual is designed to assist the user with installation, setup and operation of the **ScaleOR** and its associated displays. A list of displays that may be used with the **ScaleOR** is in the Compatible Displays section under General Information on the following page.

A numbered tab on the side of the page denotes the beginning of a section.

The functional descriptions in this manual are representative of:
Part Numbers:
The part numbers are shown in table below

Firmware:
58J0079 Rev A. This version supports only the DVI and 3G-SDI input modules.
58J0079 Rev B. This version adds support for the VGA input module.
58J0079 Rev C. This version adds support for the S-Video / Composite input module.
58J0079 Rev D. Added Alternative Mode Tolerance and Auto Select on the S-Video / Composite module.

Manual Part Number 60G0453 Rev D

Part Number	Input Module	Fiber Optic Output?
90T0009	DVI	No
90T0010	DVI	Single Fiber
90T0011	SDI	No
90T0012	SDI	Single Fiber
90T0013	VGA	No
90T0014	VGA	Single Fiber
90T0015	S-Video / Composite	No
90T0016	S-Video / Composite	Single Fiber

Intended Use and Contraindications

Intended Use:
This device is intended for use in a medical environment to deliver high quality video and graphic images.

Contraindications:
This device may not be used in the presence of flammable anesthetics mixture with air, oxygen or nitrous oxide. Also, it is not intended for life support applications.

No part of this product may come in contact with a patient. Never touch the product and a patient at the same time.

Warning:
Because invisible laser radiation may be emitted from the aperture of the port when no fiber cable is connected, avoid exposure to laser radiation and do not stare into open apertures.

For mission critical applications, we strongly recommend that a replacement unit be immediately available.

ScaleOR Overview

The **ScaleOR** accepts 1 of following 4 input modules:
DVI-D
SDI
VGA
S-Video / Composite

The drawing on page 3 shows location of the fixed output connectors and the input module.

The output mode (resolution) may be selected using the DIP switches located on the bottom of the **ScaleOR** (see Output Mode Switch Settings table on page 4).

General Information

Installation:

ScaleOR units may be stacked on a equipment carrier, a surgical cart or mounted in a standard 19" rack. Ensure that the air vents are not blocked.

Power Supply:

The provided power supply, Ault and SL Power Electronic Corp Model: MENB1030A1200C02 12VDC, includes 4 interchangeable wall plug adapters. Drawings of the power supply, its adapters, and adapter installation information are on page 5.

Compatible Displays:

1. HD displays with a DVI input.
2. HD displays with HD-SDI or 3G-SDI input.
3. HD displays with Fiber Optic input. **Note**: The **ScaleOR**'s Fiber Optic output is an optional feature.

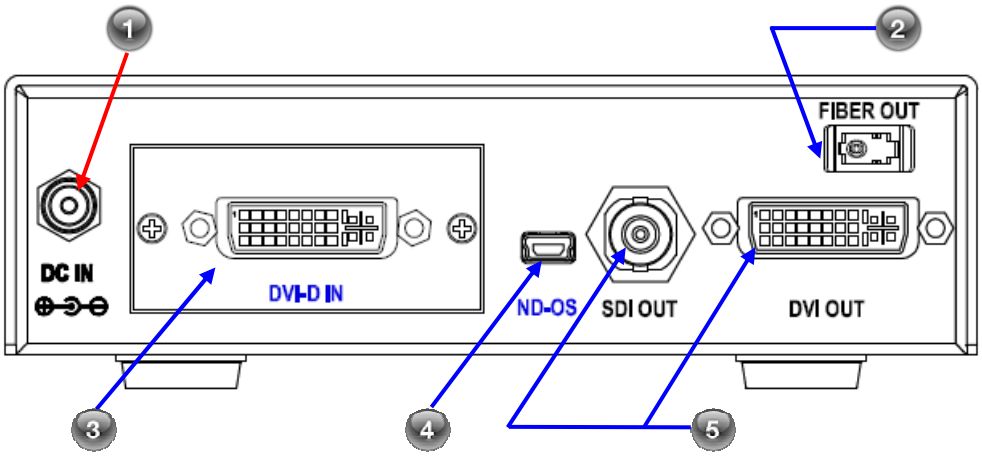
Control Options:

The **ScaleOR** may be controlled from:

1. The keypad on the front of the **ScaleOR.** Using the keypad requires that the **ScaleOR** be connected to a display.
2. A PC via the ND-OS port. See Serial Port Setup and Test on page 16.

The NDS Unified Serial Commands (P/N 60A0156) document contains a complete set of serial commands for the **ScaleOR**. Please contact your NDS sales representative for details.

Connector Panel

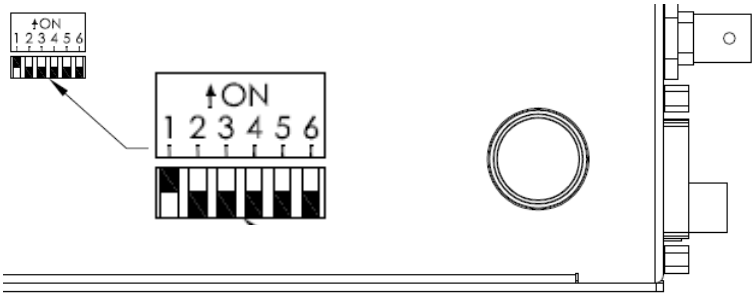


Notes:

1. Power input, use the provided 12VDC power supply only.
2. Optional Fiber Optic output
3. Input module, DVI-D module shown, all input modules are shown on page 6.
4. The ND-OS connector allows the **ScaleOR** to be controlled remotely via serial commands. It is also used to install BIOS upgrades.
5. SDI and DVI video outputs.

Output Mode Switches

The **Output Mode Switches**, accessible on the underside of the unit, allow the user to select 1 of 46 output modes. The Output Mode Switch Settings table on the following page shows the switch settings required to select a given output mode. Setting the output mode from the On Screen Menu (OSM) requires that all switches be set to off.



Electrical Symbols

Power Switch:
The Power Switch symbol is shown to the left.
The power switch is push on / push off and is shown below the Power Switch symbol. When the switch is off the ring around the center portion is white. When the switch is on, the center portion is depressed and the ring is illuminated blue. The illustration shows the switch in its **ON** state. When the **ScaleOR** is turned on the blue ring flashes at the rate of 5 flashes per second for 15 seconds then, becomes steady if a video signal is detected. If a video signal is not detected the ring continues flashing at the rate of 1 flash per second.

Output Mode Switch Settings

Legend: **F** = Off, **O** = On

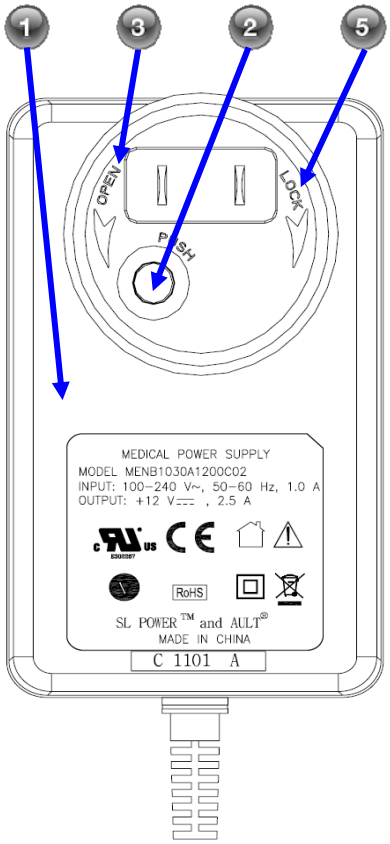
	Mode		DIP Switch					
Index	DVI Mode	SDI Mode	6	5	4	3	2	1
0	720x487/59.94P	720x480/59.94I	O	O	O	O	O	O
1	720x576/50.00P	720x576/50.00I	O	O	O	O	O	F
2	1280X720/23.98P	1280X720/23.98P	O	O	O	O	F	O
3	1280X720/24.00P	1280X720/24.00P	O	O	O	O	F	F
4	1280X720/25.00P	1280X720/25.00P	O	O	O	F	O	O
5	1280X720/29.97P	1280X720/29.97P	O	O	O	F	O	F
6	1280X720/30.00P	1280X720/30.00P	O	O	O	F	F	O
7	1280x720/50.00P	1280x720/50.00P	O	O	O	F	F	F
8	1280x720/59.94P	1280x720/59.94P	O	O	F	O	O	O
9	1280x720/60.00P	1280x720/60.00P	O	O	F	O	O	F
10	1920x1080/50.00P	1920x1080/50.00I	O	O	F	O	F	O
11	1920x1080/59.94P	1920x1080/59.94I	O	O	F	O	F	F
12	1920x1080/60.00P	1920x1080/60.00I	O	O	F	F	O	O
13	1920x1080/23.98P	1920x1080/23.98P	O	O	F	F	O	F
14	1920x1080/24.00P	1920x1080/24.00P	O	O	F	F	F	O
15	1920x1080/25.00P	1920x1080/25.00P	O	O	F	F	F	F
16	1920x1080/29.97P	1920x1080/29.97P	O	F	O	O	O	O
17	1920x1080/30.00P	1920x1080/30.00P	O	F	O	O	O	F
18	1920x1080/50.00P	1920x1080/50.00P	O	F	O	O	F	O
19	1920x1080/59.94P	1920x1080/59.94P	O	F	O	O	F	F
20	1920x1080/60.00P	1920x1080/60.00P	O	F	O	F	O	O
21	640x480/60 VGA	N/A	O	F	O	F	O	F
22	640x480/75 VGA	N/A	O	F	O	F	F	O
23	640x480/85.01 VGA	N/A	O	F	O	F	F	F
24	800x600/60.32 SVGA	N/A	O	F	F	O	O	O
25	800x600/75 SVGA	N/A	O	F	F	O	O	F
26	800x600/85.06 SVGA	N/A	O	F	F	O	F	O
27	1024x768/60 XGA	N/A	O	F	F	O	F	F
28	1024x768/75.03 XGA	N/A	O	F	F	F	O	O
29	1024x768/85 XGA	N/A	O	F	F	F	O	F
30	1152x864/70.01 XGA	N/A	O	F	F	F	F	O
31	1152x864/75 XGA	N/A	O	F	F	F	F	F
32	1152x864/85 XGA	N/A	F	O	O	O	O	O
33	1280x768/59.87 WXGA	N/A	F	O	O	O	O	F
34	1280x960/60 SXGA	N/A	F	O	O	O	F	O
35	1280x960/75 SXGA	N/A	F	O	O	O	F	F
36	1280x960/85 SXGA	N/A	F	O	O	F	O	O
37	1280x1024/60.02 SXGA	N/A	F	O	O	F	O	F
38	1280x1024/75.02 SXGA	N/A	F	O	O	F	F	O
39	1280x1024/85.02 SXGA	N/A	F	O	O	F	F	F
40	1360X768/60.01WXGA	N/A	F	O	F	O	O	O
41	1366X768/59.79 WXGA	N/A	F	O	F	O	O	F
42	1440X900/59.89 WXGA	N/A	F	O	F	O	F	O
43	1600X1200/60 UXGA	N/A	F	O	F	O	F	F
44	1680X1050/59.95 WSXGA	N/A	F	O	F	F	O	O
45	1920x1200/50 WUXGA	N/A	F	O	F	F	O	F
46	1920x1200/60 WUXGA	N/A	F	O	F	F	F	O
47	Use Menu	*	F	F	F	F	F	F

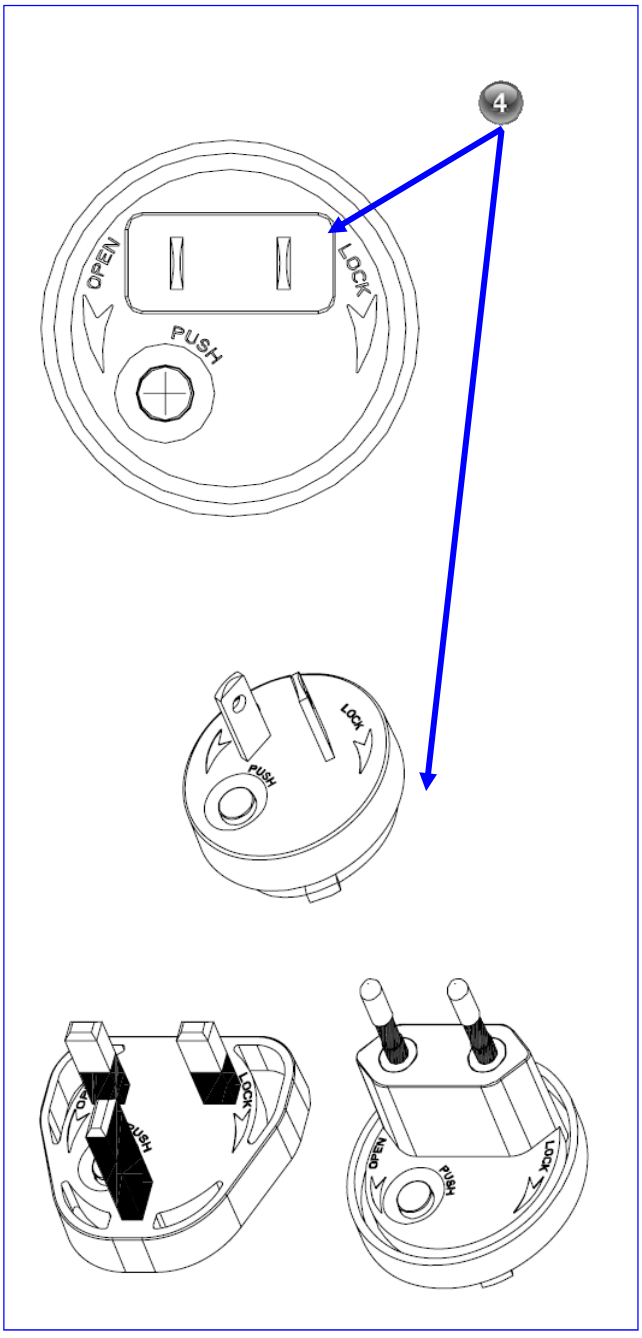
* **Note:** To set the output mode from the **ScaleOR**'s OSM, all switches must be set to **Off** .

Power Supply and Wall Adapters

The power supply is shown with the US wall adapter installed. To exchange the adapter, proceed as follows:

1. Place the power supply on your work surface as shown.
2. Press and hold the button labeled **PUSH**.
3. Twist the adapter 1/8 turn toward the **OPEN** arrow, and lift it off the power supply.
4. Select one of the provided wall adapters.
5. Align the tabs on the bottom of the adapter with the notches on the power supply and place the adapter on the power supply. Press the adapter down and twist it toward the **LOCK** arrow until it clicks into place.





Removable Input Modules

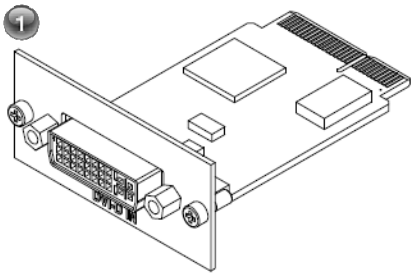
Input Modules:

Four types of input modules are available: DVI-D, 3G-SDI, VGA and S-Video / Composite

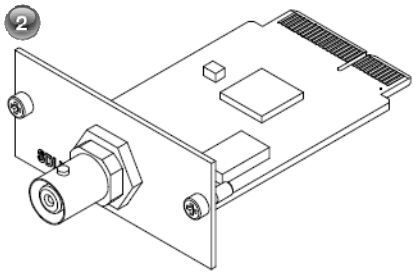
1. The DVI-D input module accepts DVI signals up to 1920 x 1200 progressive at 60Hz.
2. The 3G-SDI input module accepts SDI signals up to 1920 x 1080 progressive at 60Hz.
3. The VGA input module accepts analog signals up to 1920 x 1200 progressive at 60Hz.
4. The S-Video / Composite input module accepts S-Video / Composite NTSC or PAL signals .

Any one of the input modules shown below may be installed in the card slot.

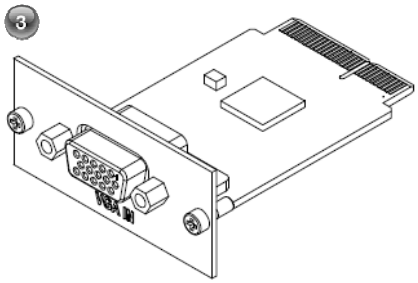
DVI-D



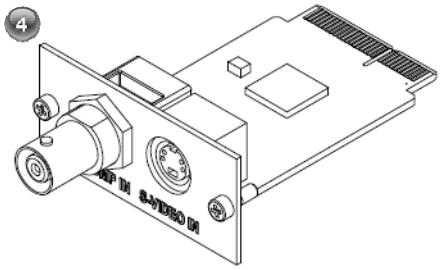
3G-SDI



VGA



S-Video / Composite



VGA Module Switches			
Function	Switch 1	Switch 2	Switch 3
RGBS	On	On	Off
YPbPr	Off	On	Off
VGA	On	Off	Off
SOG	Off	Off	Off
OSM / RS-232	Off	Off	On

1. To select the Input Format using the OSM or via Serial control switch **3** must be **On**. When switch **3** is **On** switches **1** and **2** are disabled.
2. To select the input format manually turn switch **3** **Off**. Then, using the table to the left, set switches **1** and **2** to the format of the input signal.

Module Removal and Installation

⚠ The **ScaleOR** must be turned off prior to installing or replacing the input module.

Input Module Removal:

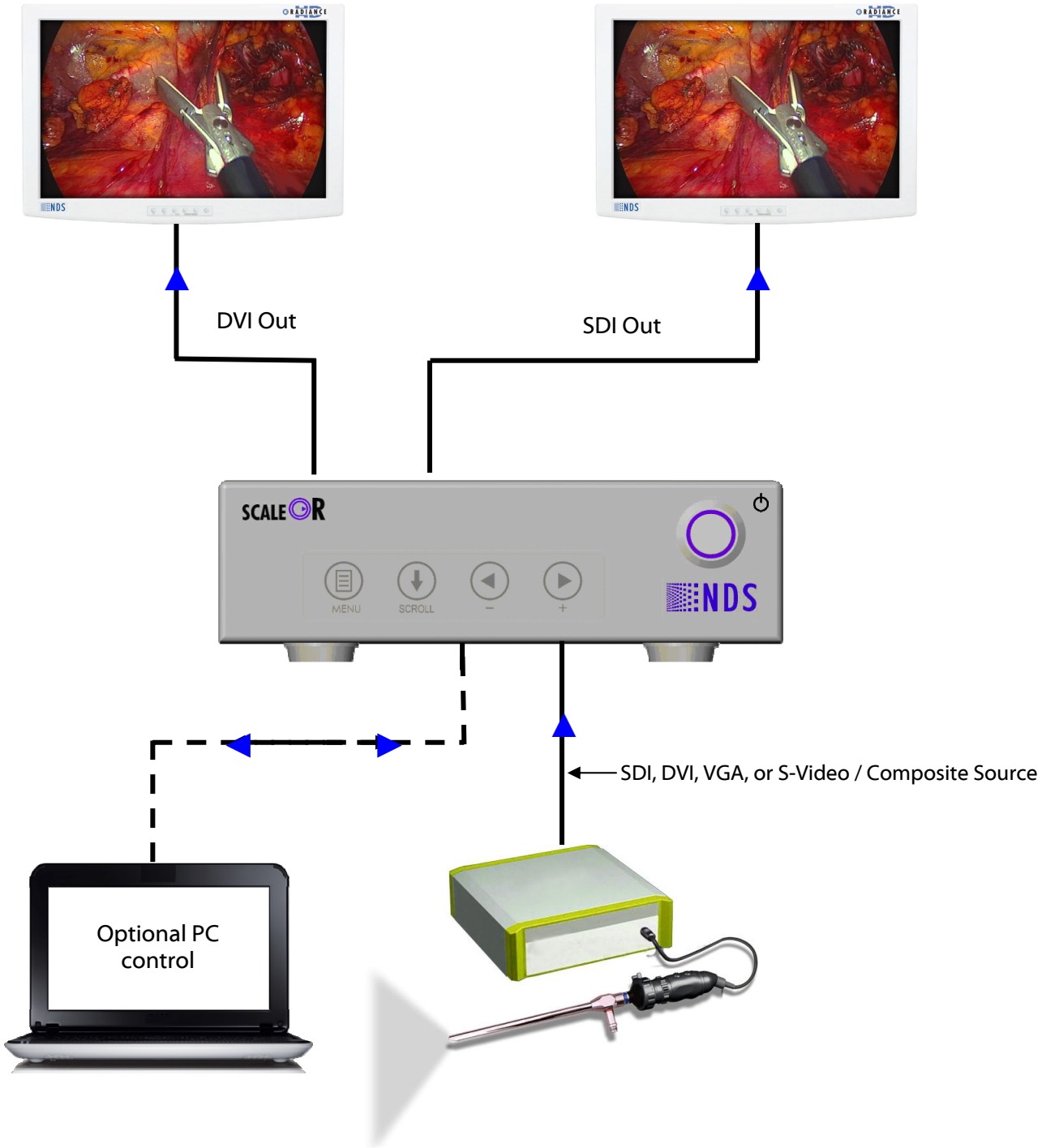
Use a number 1 Phillips screwdriver to loosen, but not remove, the screws located on the left and right sides of the module's mounting plate. When the screws are clear of the chassis, remove the module by gripping the screws and pulling the module out.

Installation:

Slide the new module into the chassis until it contacts the connector, then push gently until the module seats. The module is correctly seated when its mounting plate is flush with the chassis's back panel. Thread the module's screws into the chassis until they touch the mounting plate, then tighten each screw by turning it another quarter turn.

System Configuration Example

4



Startup

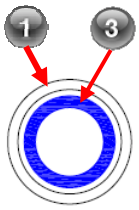
Connect one of the **ScaleOR**'s outputs to a compatible monitor. Connect a video source to the **ScaleOR**'s input.

1. Press the power button the **ScaleOR**'s front panel. The power button's illuminated blue ring flashes for 15 seconds then, if a video signal is detected, becomes steady. If a video signal is not detected the ring continues flashing.

2. The NDS logo is displayed on the monitor until the **ScaleOR**'s initialization is complete. At which time the illuminated ring stops flashing, if a video signal is detected, and becomes steady blue. At this time an image of the video signal connected to the **ScaleOR**'s input is displayed on the monitor.

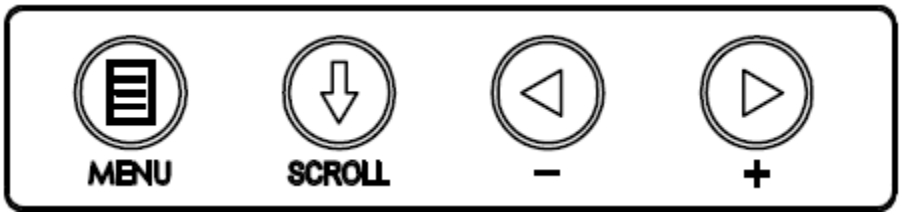
3. If the **ScaleOR** has been turned on for more than 15 seconds and a video signal is not detected the blue ring is will flash at the rate of 1 flash per second.

5



Control

A 4 button keypad, located below and to the right of the **ScaleOR** logo, allows the user to make adjustments to various **ScaleOR** parameters using the On Screen Menu (OSM) system.



6 Menu System Overview

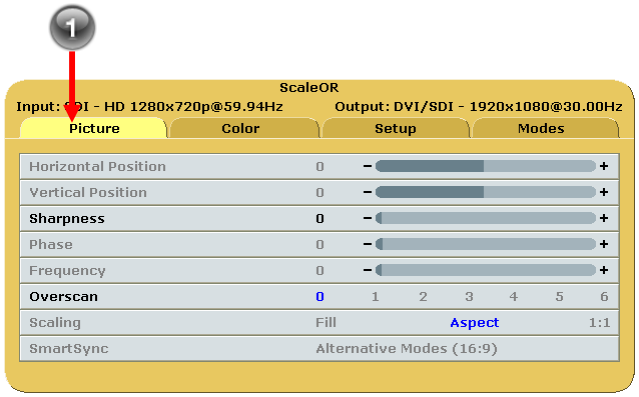
Press the **MENU** button once to open the OSM. The input and output resolution are shown at the top of the menu.

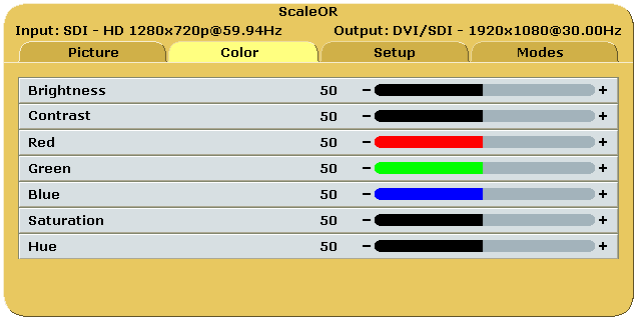
1 The Picture menu is displayed when the OSM is opened.

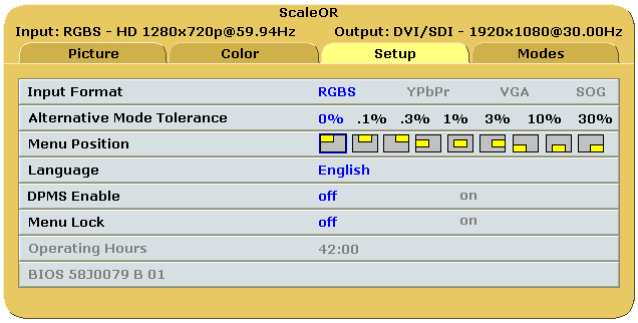
Press the ◄ or ► button to select the menu you want to work with, then press the **SCROLL** button to select the parameter. Press the ◄ or ► button to set the parameter to the desired value. Press the **MENU** button to save your changes and close the OSM.

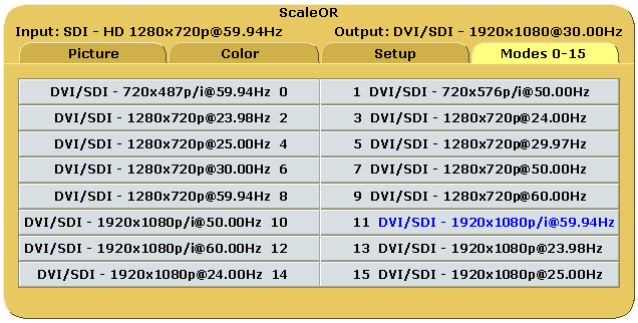
Notes:

1. Grayed out parameters are not currently accessible.

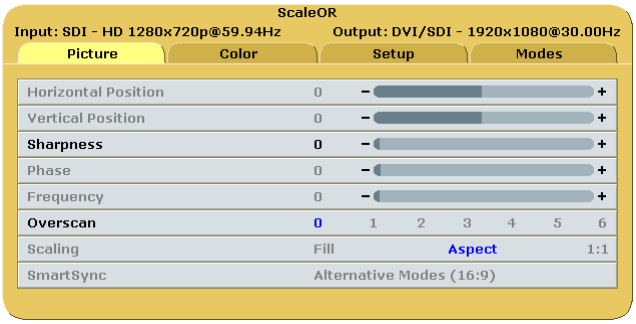








DVI and SDI Picture Menu



Sharpness:

Press ◄ or ► to adjust the sharpness (focus) of the displayed image.

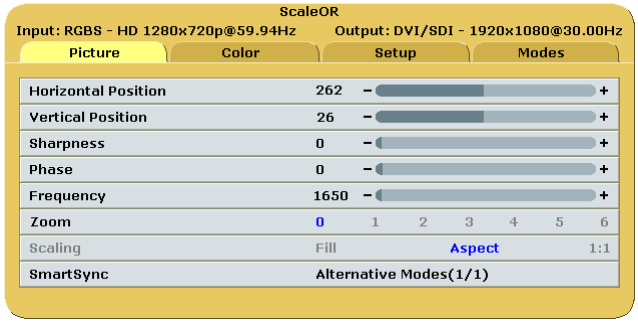
Scaling (Graphics):

This parameter is enabled when the input signal is not 16:9, not interlaced, and not 480P or 576P.
Fill = Expands the video image to fill the entire screen. The aspect ratio may not be accurately displayed. **Aspect** = Expands the video image until its largest dimension fills the screen. Image may be displayed with black bars on the top and bottom or the left and right. **1:1** = Displays the video data in its native size and aspect ratio. Image may be displayed with black bars on the top and bottom and on the left and right. Select using ◄ or ► buttons.

Zoom (Video):

This parameter is enabled when the input is 16:9, 480P, 576P, or interlaced.
0 = The image is displayed at a size that fills the screen without losing any video information. The image presented to the display may include black bars top and bottom or left and right.
1, 2, 3, 4, 5 or **6** = The image is linearly enlarged, while remaining centered, in incremental steps. As the image becomes larger video information will be lost from the top and bottom and / or left and right. Select using ◄ or ► buttons.

VGA, RGBS, YPbPr, and SOG Picture Menu



Horizontal Position:
Moves the image to the left or right. Press ◄ or ► to horizontally center the image.

Vertical Position:
Moves the image up or down. Press ◄ or ► to vertically center the image.

Sharpness:
Press ◄ or ► to adjust the sharpness (focus) of the displayed image.

Phase:
Press ◄ or ► to adjust the phase of the display's pixel clock.

Frequency:
Adjusts the frequency of the display's pixel clock. With Scaling set to **Fill** adjust until image just fills the screen horizontally. Press ◄ or ► to adjust the frequency of the display's pixel clock.

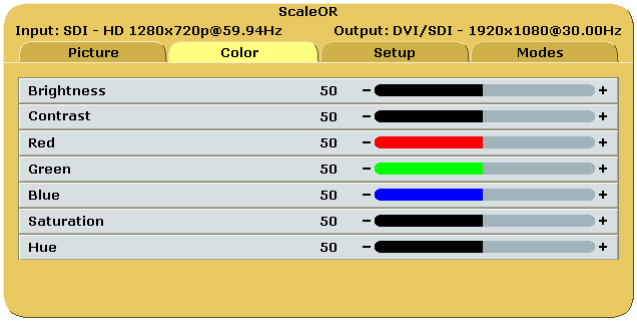
Scaling (Graphics):
This parameter is enabled when the input signal is not 16:9, not interlaced, and not 480P or 576P.
Fill = Expands the video image to fill the entire screen. The aspect ratio may not be accurately displayed. **Aspect** = Expands the video image until its largest dimension fills the screen. Image may be displayed with black bars on the top and bottom or the left and right. **1:1** = Displays the video data in its native size and aspect ratio. Image may be displayed with black bars on the top and bottom and on the left and right. Select using ◄ or ► buttons.

Zoom (Video):
This parameter is enabled when the input is 16:9, 480P, 576P, or interlaced.
0 = The image is displayed at a size that fills the screen without losing any video information. The image presented to the display may include black bars top and bottom or left and right.
1, 2, 3, 4, 5 or **6** = The image is linearly enlarged, while remaining centered, in incremental steps. As the image becomes larger video information will be lost from the top and bottom and / or left and right. Select using ◄ or ► buttons.

SmartSync™ / Alternative Modes
On initialization NDS' proprietary **SmartSync** technology examines the incoming signal and automatically displays the video image in its proper format. To run **SmartSync** highlight the **SmartSync / Alternative Modes** parameter and press the ◄ button.

To select an alternate mode (format) highlight the **SmartSync / Alternative Modes** parameter and press the ► button. The mode increments each time the ► button is pressed until the selected mode equals the maximum available, the next time ► pressed the first mode is restored. **Alternative Modes** are used to manually distinguish between modes (resolutions) whose timing characteristics are very close.

Color Menu



Brightness:
Press the ◄ or ► button to adjust brightness.

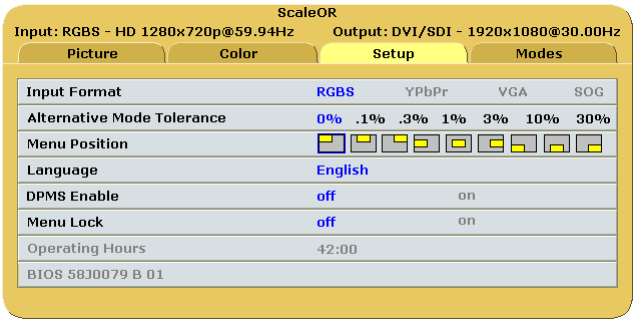
Contrast:
Press the ◄ or ► button to adjust contrast.

Red, Green, Blue:
Press the ◄ or ► button to increase or decrease the intensity of the selected color.

Saturation (Video):
This parameter is enabled only when the input is 16:9, 480P, 576P, or interlaced.
Press ◄ or ► to set the saturation (color intensity) of the image.

Hue (Video):
This parameter is enabled only when the input is 16:9, 480P, 576P, or interlaced.
Press ◄ or ► to set the hue (color tint) of the image.

Setup Menu



Input Format:

Press the ◄ or ► button to match the format of the input signal.

Notes:

1. This parameter is not available when a **DVI** or **3G - SDI** input module is installed in the **ScaleOR**.
2. If this parameter is "grayed" out when the **VGA** module is installed, then the **VGA** module has been preconfigured to accept only the format that appears in blue. To select a different Input Format, or configure the **VGA** module to allow the Input Format to be selected from the OSM or via an RS-232 serial command consult the VGA Module Switches table on page 6.
3. When the **S-Video / Composite** module is installed, there are three Input Format parameter options: Auto*, S-Video, or Composite. When Auto is selected the **ScaleOR** switches between the S-Video and Composite inputs until a signal is detected. Each input is scanned for approximately five seconds after which the **ScaleOR** switches to the other input. When S-Video is selected, only the S-Video input is scanned. The same is true the Composite input is selected. *The Auto option is available with BIOS 58J0079 Rev D and later.

Alternative Mode Tolerance:

This parameter allows the user compensate for input signals whose timing parameters may differ from those stored in the **ScaleOR**. Press the ◄ or ► button to select one of the tolerance parameters. The Alternative Mode Tolerance options are available with BIOS 58J0079 Rev D and later.

Menu Position:

Places the menu in 1 of 9 predefined screen positions. Press the ◄ or ► button to select any of the 9 screen positions.

Language:

English only.

DPMS Enable:

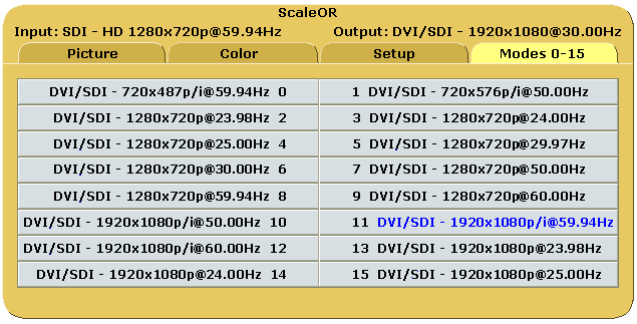
Display Power Management System. When DPMS is enabled (**on**), and no input signal is present, or the signal is removed, then, if the unit is connected to a monitor, the "ScaleOR D.P.M.S" message is displayed for 10 - 15 seconds. After which the **ScaleOR** goes into standby mode, and turns its outputs off. When an input signal is applied the **ScaleOR** comes out of standby and turns its outputs on. Press the ► button to enable DPMS, press the ◄ button to disable DPMS.

Menu Lock:

Disables access to menu system. This prevents inadvertent changes to the **ScaleOR**'s settings. To enable Menu Lock, press the ► button. MENU LOCKED is displayed when the ◄ button is pressed. To unlock, simultaneously press and hold the MENU and SCROLL buttons until MENU UNLOCKED is displayed.

Operating Hours: Shows the ScaleOR's hours of operation.
BIOS: Installed version of the ScaleOR's BIOS firmware.

Modes Menu



The available output modes are shown when the **Modes** tab is selected. If the **Modes** tab is selected using the ► button, the tab's legend changes to **Modes 0-15** and modes 0 through 15 are displayed. Pressing the ► button a second time, changes the tab's legend to **Modes 16-31** and modes 16 through 31 are displayed. If the ► button is pressed a third time the tab's legend changes to **Modes 32-47**, modes 32 through 46 are displayed. Mode 47 is not implemented and is shown as None. Finally, pressing the ► button a fourth time selects the **Picture** menu. When the ◄ button is used to select the **Modes** tab, the sequence described above occurs in reverse order. All available output modes are shown in the table on the following page.

Press the ► button to select the group of modes (**0-15**, **16-31** or **32-47**) that contains the output mode that you want to use.

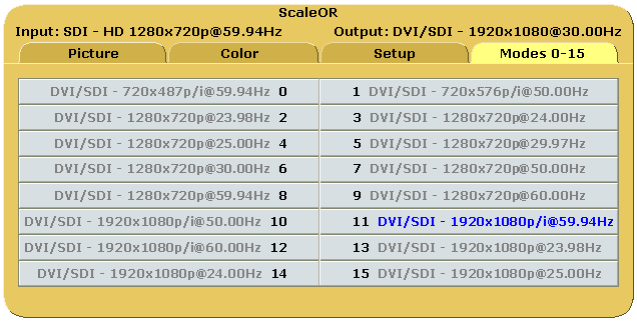
SCROLL Press the **SCROLL** button to highlight the pair of modes that contains the mode to be used. This message Press: ◄ Select Left, ► Select Right appears on the bottom of the OSM.

Press the ◄ or ► button to select the new output mode. The following message appears on bottom of the OSM. Press: Confirm, Cancel

MENU Press this button to confirm the new output mode. The following message is shown on the bottom of the OSM. New Output Format Confirmed If the **MENU** button is not pressed within **20** seconds the output mode reverts to the previous output mode.

SCROLL Press this button to cancel the new output mode. The following message is shown on the bottom of the OSM. New Output Format Cancelled

If the Modes menu appears as shown below, then one or more of the mode switches is turned **<u>on</u>**, and the Modes menu is locked. To use the Modes menu turn all of the mode switches **<u>off</u>**. See page 3 for the Output Mode Switches location.



Note: When the Modes menu is selected, the currently active mode is shown in blue, even if the menu is locked.

Output Modes Table

Mode Index	Input:	Mode	Mode Index	Input:	Mode	Mode Index	Input:	Mode
0000	DVI/SDI	720x487p/i@59Hz	0016	DVI/SDI	1920x1080p@29Hz	0032	DVI Only	1152x864@85Hz
0001	DVI/SDI	720x576p/i@50Hz	0017	DVI/SDI	1920x1080p@30Hz	0033	DVI Only	1280x768@59Hz
0002	DVI/SDI	1280x720p@23Hz	0018	DVI/SDI	1920x1080p@50Hz	0034	DVI Only	1280x960@60Hz
0003	DVI/SDI	1280x720p@24Hz	0019	DVI/SDI	1920x1080p@59Hz	0035	DVI Only	1280x960@75Hz
0004	DVI/SDI	1280x720p@25Hz	0020	DVI/SDI	1920x1080p@60Hz	0036	DVI Only	1280x960@85Hz
0005	DVI/SDI	1280x720p@29Hz	0021	DVI Only	640x480@60Hz	0037	DVI Only	1280x1024@60Hz
0006	DVI/SDI	1280x720p@30Hz	0022	DVI Only	640x480@75Hz	0038	DVI Only	1280x1024@75Hz
0007	DVI/SDI	1280x720p@50Hz	0023	DVI Only	640x480@85Hz	0039	DVI Only	1280x1024@85Hz
0008	DVI/SDI	1280x720p@59Hz	0024	DVI Only	800x600@60Hz	0040	DVI Only	1360x768@60Hz
0009	DVI/SDI	1280x720p@60Hz	0025	DVI Only	800x600@75Hz	0041	DVI Only	1366x768@59Hz
0010	DVI/SDI	1920x1080p/i@50Hz	0026	DVI Only	800x600@85Hz	0042	DVI Only	1440x900@59Hz
0011	DVI/SDI	1920x1080p/i@59Hz	0027	DVI Only	1024x768@60Hz	0043	DVI Only	1600x1200@60Hz
0012	DVI/SDI	1920x1080p/i@60Hz	0028	DVI Only	1024x768@75Hz	0044	DVI Only	1680x1050@59Hz
0013	DVI/SDI	1920x1080p@23Hz	0029	DVI Only	1024x768@85Hz	0045	DVI Only	1920x1200@50Hz
0014	DVI/SDI	1920x1080p@24Hz	0030	DVI Only	1152x864@70Hz	0046	DVI Only	1920x1200@60Hz
0015	DVI/SDI	1920x1080p@25Hz	0031	DVI Only	1152x864@75Hz	0047	N/A	None

***Note:** If a Mode contains "p/I" then the "p" (progressive scan) applies to the DVI output signal and the "i" (interlaced scan) applies to the SDI output signal. Modes that contain only a "p" are progressive whether the output is DVI or SDI. The DVI Only modes are always progressive and only the DVI port will have an output signal.

Restoring Factory Defaults

To restore the Factory Defaults turn the ScaleOR off, press and hold the **MENU** button. While holding the **MENU** button, turn the unit on. After approximately 10 seconds the "Restoring Factory Defaults" message appears on the monitor connected to the ScaleOR.

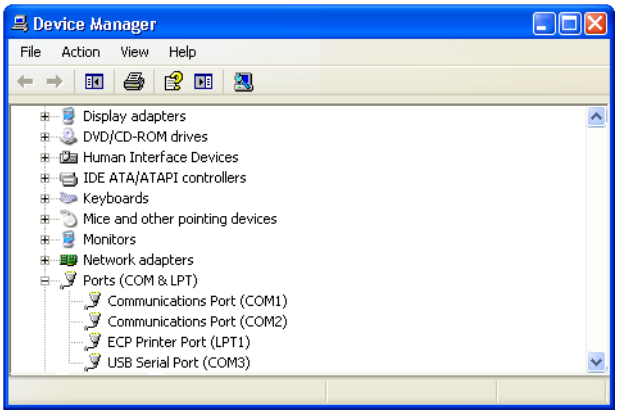
Serial Port Setup and Test

Hardware Setup

Turn the **ScaleOR** on. Connect your PC to the **ScaleOR** using a USB to Mini 5 USB (NDS P/N 35Z0047) or equivalent cable.

Device Manager

Open the PC's Device Manager, and select Ports (COM & LPT). Find the USB Serial Port (COMx) entry. Use the port number in the ( ) when you setup Hyper Terminal.



Hyper Terminal Setup

The table below shows the serial port parameters.

Click Start

Select All Programs > Accessories > Communications

Click Hyper Terminal

Enter a name for the new connection and click OK.

In the **Connect To** menu, select the COM port number that matches the USB Serial Port you found using the Device Manager from the **Connect Using** drop down menu and click OK.

In the **COM Properties** menu:

- Set Bits per second to 19200
- Set Data bits to 8
- Set Parity to None
- Set Stop bits to 1
- Set Flow control to None
- Click OK

Parameter	Setting
Baud Rate	19200
Parity	None
Data Bits	8
Stop Bits	1
Flow Control	None

Click File, click Properties, then select ASCII Setup from the Properties menu

In the ASCII Setup menu select:

- Echo typed characters locally.
- Click OK to exit ASCII Setup

Click OK to exit configuration. Click File and select Save to save the configuration.

Serial Port Test

Place the cursor in the text area of the Hyper Terminal window and press Enter, **!0003C3** is displayed.

Type **:0000000080** and press Enter.

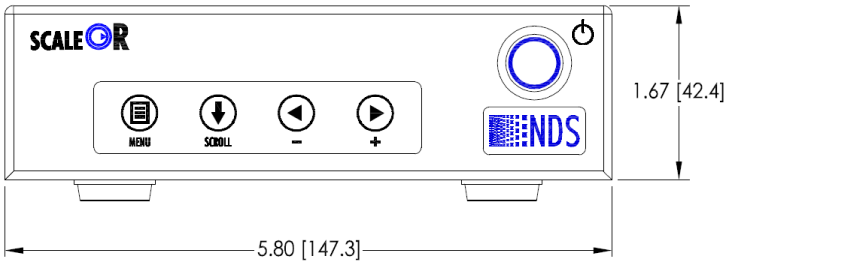
!000058J0079RBBxx is displayed. Where:

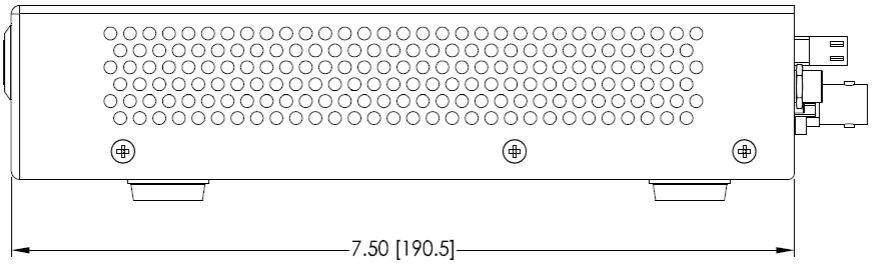
- ! = Start of response.
- 0000 = Response OK.
- 58J = BIOS type.
- 0079 = BIOS number.
- R = Revision letter.
- BB = Build number (minor revision).
- xx = Checksum

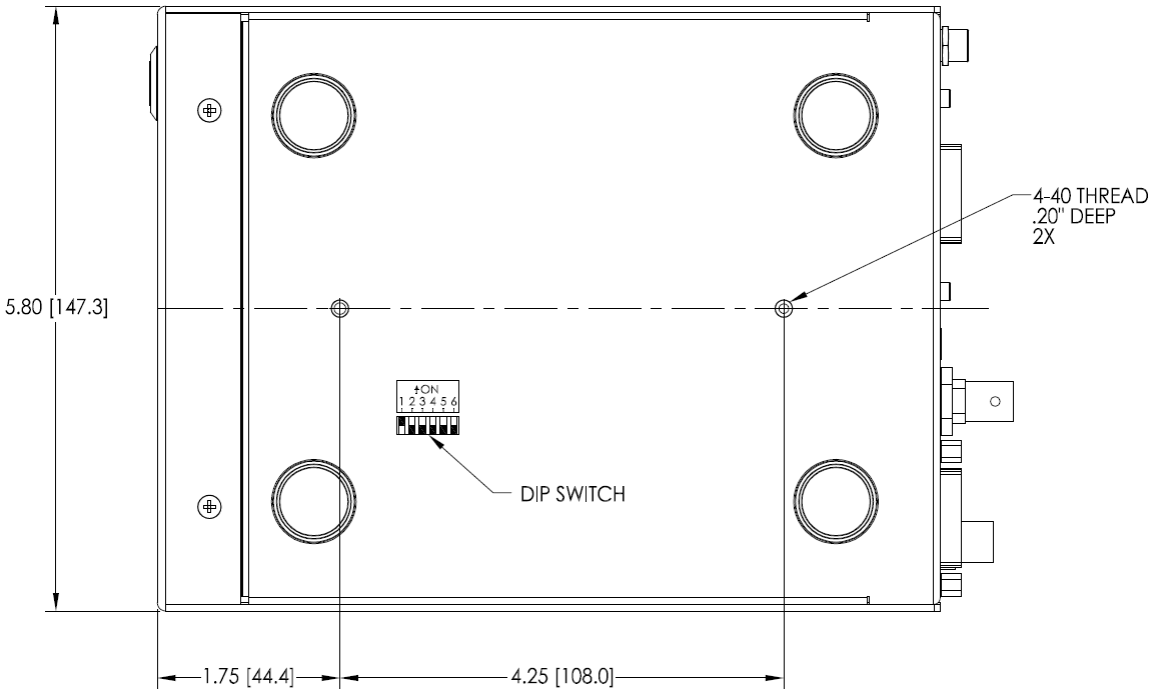
A complete set of **ScaleOR** serial commands is available. See the General Information section on page 2.

Troubleshooting and Test Section

Problem	Possible Causes and Remedies
Power switch does not illuminate in the **ON** state	Loose power cable: Verify that the power cable is fully inserted into the unit's power connector and that the power supply's connector collar is properly threaded onto the **ScaleOR**'s power connector. Defective power supply: Replace the power supply. Wall socket: Some wall sockets have on / off switches built in. If the socket you are using has a built in switch, verify that is in the on position. Mitigation: Bypass the **ScaleOR** by connecting the output of the video source directly to a monitor.
Confidence test	Turn the **ScaleOR** off, then connect its DVI output port to a powered up monitor. Turn the ScaleOR on, the **NDS** logo should appear on the monitor approximately 10 seconds after the ScaleOR is turned on. Turn the **ScaleOR** off, then connect its SDI output port to the monitor and repeat the test. If your **ScaleOR** has a Fiber Optic output, turn the **ScaleOR** off, then connect its fiber Optic output port to the monitor and repeat the test.
Video is not displayed	If the **ScaleOR**'s power button's blue ring is flashing once per second, then the unit is not detecting a video signal. Verify that an input signal is connected to the unit's input. If there is a connection try replacing the video cable. If video appears, then the cable is bad. If video does not appear, then connect the unit to a different video source. If video appears, then the previous video source is turned off, or defective. If video still does not appear, then the **ScaleOR**'s Input module may be defective, or not properly seated. Try reseating the input module. If that doesn't clear the problem then the input module is defective. If you determine that the input module is defective, please contact customer service for assistance. Mitigation: If possible, connect the video source directly to the video source.
Video is not displayed from a given output port	Verify that video is displayed from the DVI or SDI output port. If video from the DVI port is displayed, and not from the SDI port then ScaleOR's output mode may set to a DVI only mode (see Output Modes Table on page 15), the cable connecting the SDI port to a monitor may be bad or the SDI output is defective. If video from the SDI port is displayed, and not from the DVI port then the cable from the DVI port may be bad, or the DVI port is defective. If you determine that one of the output ports is defective, please contact customer service for assistance.
External control failure	USB cable is loose or defective: Verify that the USB cable is fully inserted into the **ScaleOR**'s USB port and the PC's USB port. Control program has failed: Restart the program Controlling PC has failed: Restart the PC Mitigation: Control the **ScaleOR** from its front panel Keypad

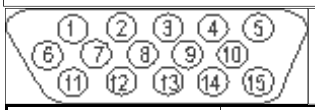

SCALE
MENU
SCROLL
NDS
1.67 [42.4]
5.80 [147.3]


7.50 [190.5]


4-40 THREAD
.20" DEEP
2X
5.80 [147.3]
ON
DIP SWITCH
1.75 [44.4]
4.25 [108.0]

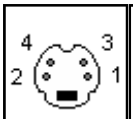
Connectors and Pin Outs

Input Connectors



VGA

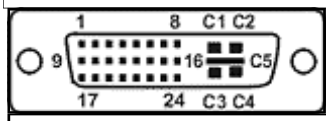
1 RED	6 GND RED	11 N. C.
2 GREEN	7 GND GREEN	12 DDC_SDA
3 BLUE	8 GND BLUE	13 HORIZ SYNC
4 N.C.	9 +5VDC	14 VERT SYNC.
5 GND	10 SYNC GND	15 DDC_SCL



S-Video

Pin	Name	Description
1	GND	Ground (Y)
2	GND	Ground (C)
3	Y	Intensity (Luminance)
4	C	Color (Chrominance)

DVI Input and Output Connectors

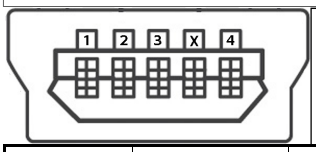


DVI-D*
Digital only.

* Compliant with DVI 1.0

PIN#	SIGNAL	PIN#	SIGNAL
1	T.M.D.S. DATA 2-	**16**	HOT PLUG DETECT
2	T.M.D.S. DATA 2+	**17**	T.M.D.S. DATA 0-
3	T.M.D.S. DATA 2/4 SHIELD	**18**	T.M.D.S. DATA 0+
4	T.M.D.S. DATA 4-	**19**	T.M.D.S. DATA 0/5 SHIELD
5	T.M.D.S. DATA 4+	**20**	T.M.D.S. DATA 5-
6	DDC CLOCK	**21**	T.M.D.S. DATA 5+
7	DDC DATA	**22**	T.M.D.S. CLOCK SHIELD
8		**23**	T.M.D.S. CLOCK+
9	T.M.D.S. DATA 1-	**24**	T.M.D.S. CLOCK-
10	T.M.D.S. DATA 1+		
11	T.M.D.S. DATA 1/3 SHIELD		
12	T.M.D.S. DATA 3-		
13	T.M.D.S. DATA 3+		
14	+5V POWER		
15	GND		

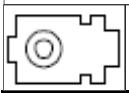
Data Connector



USB Connector

Pin	Name	Description
1	VCC	+5 VDC
2	D-	Data -
3	D+	Data +
X	ID	N/C
4	GND	Ground

Output Connector



Fiber Optic

Pin	Name	Description
Input	Input	Serial Video Data

Cable Bend Radius

We recommend that the bend radius of metallic cables be no less than 2.5 inches (63 mm) or 7 times the diameter of the cable whichever is greater. The bend radius of Fiber Optic cables should be no less than 10 times the diameter of the cable. Sharper bends may damage the cable and / or degrade the video signal.

Specifications[1]

DVI and Fiber Output Resolution	User selectable. See Output Modes Table on page 15
SDI Output Resolution	User selectable. See Output Modes Table on page 15
HD-SDI Input signal level	.8 to 2.0 V p-p
DC Power Consumption	22W
AC Power Consumption	30W
System Weight	1.3lbs (0.59 kg)
Environmental	
Operating Temperature	+32 to 95^{0}F (0 to 35^{0}C)
Operating Humidity	20 to 85% RH
Operating Altitude	6562 ft (2,000 m)
Storage Temperature	-4 to +122^{0}F (-20 to +50^{0}C)
Storage Humidity	5 to 85% RH
Storage Altitude	32808 ft (10,000 m)

Notes:

1. Specifications are subject to change without notice. Contact NDS for recent specifications.

DVI Supported Resolutions	
Signal Parameter	Supported Range
Active Resolution	640 x 480 min to 1920 x 1200 max
(Horizontal x Vertical	
Refresh Rate	23.98 Hz up to 85 HZ
(Vertical Frequency)	
Pixel Clock	25 MHz up to 165 MHz
(Pixel Frequency)	

The DVI-D input can automatically detect any valid digital DVI signal within the resolution, vertical refresh, and pixel clock ranges specified in the table above. Signals outside of any of the specified ranges may not be supported.

SDI Supported Resolutions					
Horizontal Resolution (pixels)	Vertical Resolution (lines)	Vertical Frequency (Hz)	Horizontal Resolution (pixels)	Vertical Resolution (lines)	Vertical Frequency (Hz)
720	480i	29.97	1280	720p	50
720	483i	29.97	1280	720p	59.94
720	487i	29.97	1920	1080sF	24
720	576i	25	1920	1080p	24
720	587i	25	1920	1080p	25
1280	720p	24	1920	1080p	29.97
1280	720p	25	1920	1080i	25
1280	720p	30	1920	1080i	29.97

VGA, RGBS, and YPbPr Supported Resolutions								
Horizontal Resolution (pixels)	Vertical Resolution (lines)	Vertical Frequency (Hz)	Horizontal Resolution (pixels)	Vertical Resolution (lines)	Vertical Frequency (Hz)	Horizontal Resolution (pixels)	Vertical Resolution (lines)	Vertical Frequency (Hz)
720	480i	29.97	1024	768i	43.48	1280	1024i	43.44
720	480p	59.94	1024	768	50	1280	1024	60
720	576i	25	1024	768	59.94	1280	1024	60.02
720	576p	50	1024	768	60	1280	1024	75.02
640	350	50	1024	768	64	1280	1024	85.02
640	350	60	1024	768	70.07	1280	480p	59.94
640	350	70	1024	768	75.03	1280	576p	50
640	400	50	1024	768	84.99	1294	960	59.96
640	400	70	1152	576	50	1440	900	59.94
640	480	50	1152	864	60.05	1600	1200i	48.04
640	480	60	1152	864	70.01	1600	1200	60
640	480	67	1152	864	75	1920	1080sF	24
640	480	70	1152	864	85	1920	1080p	24
640	480	72.81	1152	900	66	1920	1080p	25
640	480	75	1280	720p	24	1920	1080p	29.97
640	480	85.01	1280	720p	25	1920	1080i	25
720	400	70	1280	720p	30	1920	1080i	29.97
720	400	85.04	1280	720p	50	1920	1080p	50
800	600	56.25	1280	720p	59.94	1920	1080p	59.94
800	600	60.32	1280	960i	29.97	1920	1200	30
800	600	60.38	1280	960	59.94	1920	1200	50
800	600	72.19	1280	960	60			
800	600	75	1280	960	75			
800	600	85.06	1280	960	85			

Inputs	Connector Type
DVI	DVI-D
3G-SDI	BNC, 75 Ohm terminated
VGA / RGBS / YPbPr / SOG	HD-15
S-video	DIN-4
Composite	BNC, 75 Ohm terminated
Outputs	**Connector Type**
DVI	**DVI-D**
SDI	**BNC**
Fiber	**LC**

Cleaning and Disinfecting Instructions

⚠ Prior to cleaning and surface disinfection, the unit should be turned **OFF** and disconnected from its power source.

Cleaning:
Thoroughly wipe all exterior surfaces with a lint-free cloth that has been dampened with an acceptable cleaning agent. Acceptable cleaning materials are listed below. Remove residual detergent by wiping all exterior surfaces with a lint-free cloth dampened with distilled water.

Disinfecting:
Disinfect the unit by wiping all exterior surfaces with a lint-free cloth dampened with 80% Ethyl Alcohol. Allow the unit to air dry.

⚠ **Cautions:**
Do not allow liquids to enter the interior of the unit, and do not permit exterior surfaces to come into contact will unacceptable solvents such as those listed below, as severe damage to the unit may result.

Acceptable Cleaning Materials:
Vinegar (distilled white vinegar, 5% acidity)
Ammonia-based glass cleaner

Acceptable Disinfecting Material:
Ethanol 80 % by volume

Unacceptable solvents:
MEK (Methyl Ethyl Ketone)
Toluene
Acetone

Note:
The acceptable cleaning and disinfecting materials listed above have been tested on NDS products and, when used as directed, do not harm the product's finish and or its plastic components.

Electromagnetic Compatibility (EMC) Tables

All medical electronic devices must conform to the requirements of IEC 60601-1-2. Precautions, adherences to the EMC guideline information provided in this manual and verification of all medical devices in simultaneous operation are required to ensure the electromagnetic compatibility and co-existence of all other medical devices prior to a surgical procedure.

The EMC tables on next three pages are provided for your reference.

EMC Tables

Guidance and manufacturer's declaration – electromagnetic emissions		
The product is intended for use in the electromagnetic environment specified below. The customer or the user of the product should assure that it is used in such an environment.		
Emissions	**Compliance**	**Electromagnetic environment-- guidance**
RF emissions CISPR 11	Group 1	The product uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class A	The product is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000-3-2	Not Applicable	
Voltage fluctuations/ flicker emissions IEC 61000 -3-3	Not Applicable	

Guidance and manufacturer's declaration 211; electromagnetic immunity			
The product is intended for use in the electromagnetic environment specified below. The customer or the user of the product should assure that it is used in such an environment.			
Immunity test	**IEC 60601 test level**	**Compliance level**	**Electromagnetic environment guidance**
Electrostatic discharge (ESD) IEC 61000-4-2	±6 kV contact ±8 kV air	±6 kV contact ±8 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30 %.
Electrical fast transient/burst IEC 61000-4-4	±2 kV for power supply lines	±2 kV for power supply lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	±1 kV line(s) and neutral	±1 kV line(s) and neutral	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5 % U_T (>95 % dip in U_T) for 0,5 cycle 40 % U_T (60 % dip in U_T) for 5 cycles 70 % U_T (30 % dip in U_T) for 25 cycles <5 % U_T (>95 % dip in U_T) for 5s	<5 % U_T (>95 % dip in U_T) for 0,5 cycle 40 % U_T (60 % dip in U_T) for 5 cycles 70 % U_T (30 % dip in U_T) for 25 cycles) <5 % U_T (>95 % dip in U_T) for 5s	Mains power quality should be that of a typical commercial or hospital environment. If a dips or an interruption of mains power occurs, the current of the product may be dropped off from normal level, it may be necessary to use uninterruptible power supply or a battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	Not applicable	Not applicable
NOTE U_T is the a.c. mains voltage prior to application of the test level			

EMC Tables

Guidance and manufacturer's declaration – electromagnetic immunity

The product is intended for use in the electromagnetic environment specified below. The customer or the user of the product should assure that it is used in such an environment.

Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment – guidance
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	3 Vrms	Portable and mobile RF communications equipment should be used no closer to any part of the product, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance $d = 1{,}2\sqrt{P}$ $d = 1{,}2\sqrt{P}$ 80 MHz to 800 MHz $d = 2{,}3\sqrt{P}$ 800 MHz to 2,5 GHz where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation Distance in metres (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey,a should be less than the compliance level in each frequency range.b Interference may occur in the vicinity of equipment marked with the following symbol:
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2.5 GHz	3 V/m	

NOTE 1 At 80 MHz and 800 MHz, the higher frequency range applies.
NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

a. Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the product is used exceeds the applicable RF compliance level above, the product should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the product.

b. Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.

Recommended separation distances between portable and mobile RF communications equipment and the product

The product is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the product can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the product as recommended below, according to the maximum output power of the communications equipment.

Rated maximum output power (W) of transmitter	Separation distance, in meters according to frequency of transmitter		
	150 kHz to 80 MHz	80 MHz to 800 MHz	800 MHz to 2.5 GHz
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23

For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

NOTE 1 At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.
NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

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